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Spontaneous ferromagnetic spin ordering at the surface of La2 Cu O4

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Abstract

Magnetic properties of high purity stoichiometric La2 Cu O4 nanoparticles are systematically investigated as a function of particle size. Ferromagnetic single-domain spin clusters are shown to spontaneously form at the surface of fine grains as well as paramagnetic defects. Hysteresis loops and thermomagnetic irreversibility are observed in a wide temperature range 5-350 K with the remnant moment and coercivity gradually decreasing with increasing temperature. Possible origins of the spontaneous surface ferromagnetic clusters and the relation of our data to the appearance of unusual magnetic phenomena and phase separation of doped cuprates are discussed.

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